



US Army Corps
of Engineers

DCAF Bulletin

Design Construction Analysis Feedback

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CEMP-C Construction

Subject: Fire Dampers

Applicability: Information

Reference: DCAF Bulletin 88-8 dated 6 March 88, subject Fire Dampers.

Purpose: This DCAF Bulletin supersedes referenced DCAF 88-8. This DCAF updates the contract requirements for installation of fire dampers.

Discussion: The designer must indicate on the drawings the location of each fire damper. Approved fire dampers shall be provided where air ducts penetrate or terminate at openings in walls or partitions required to have a fire resistance rating of 2 hours or more. See figure 1. Approved fire dampers shall be provided in all air transfer openings in partitions required to have a fire resistance rating and in which other openings are required to be protected.

Fire dampers used for the protection of openings in walls, partitions or floors with fire resistance ratings of less than 3 hours shall have 1½ hour fire protection rating. Fire dampers used for the protection of openings in walls, partitions or floors having a fire resistance rating of 3 hours or more shall have a 3 hour fire protection rating. Fire dampers shall conform to the requirements of NFPA 90A and UL 555. Fire dampers shall be automatic operating type and shall have a dynamic rating suitable for the maximum air velocity and pressure differential to which it will be subjected. Per CEGS 15990 (Testing, Adjusting And Balancing of HVAC Systems) fire dampers shall be tested at system design air flow to ensure proper closure in accordance with NFPA 90A prior to building occupancy.

Fire dampers shall be approved and labeled for the specific application and shall be installed according to their listing. Dampers shall be installed so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition or floor slab depth or thickness. Unless otherwise indicated, the installation details given in SMACNA (Fire Smoke And Radiation Damper Installation Guide

for HVAC Systems), see figure 2, and in manufacturer's instructions for fire dampers shall be followed, the term "unless otherwise indicated" shall be interpreted to mean "if not stated or shown by the manufacturer's listed installation instructions". See figures 3&4. The fire damper manufacturer's installation instructions as tested and approved by UL must be used in lieu of SMACNA where applicable.

Access doors shall be provided in duct work at all fire dampers and shall conform to SMACNA. Doors shall be minimum 15 by 18 inches, unless otherwise shown. Where duct size will not accommodate this size door, the doors shall be made as large as practicable. Doors in insulated ducts shall be the insulated type.

Thorough evaluation of contract documents during BCOE reviews and attention to the above technical requirements prior to shop drawing approval will assure fire damper compliance with applicable code requirements. Preparatory and initial inspection teams must pay attention to the above criteria in order to insure installations fully meet the approved manufacturer's instructions which represents the conditions of the UL approval of the fire damper. This Construction Bulletin was coordinated with Engineering Division (CEMP-ET).


CHARLES R. SCHROER
Chief, Construction Division

Typical Installation Details

- (A) Retaining Angles:
Minimum $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 0.054$ (16 ga.)
Retaining angles must lap structural opening 1" minimum and cover corners of openings.
- (B) Clearance: $\frac{1}{8}''$ Per Linear Foot
Both Dimensions (see Note 1 below)
- (C) Steel Sleeve: See Schedule 2
- (D) Approved Fire Damper (curtain or blade type)
- (E) Secure Retaining Angles To Sleeve
Only, On 8" Centers With:
1. $\frac{1}{2}''$ long Welds Or
 2. $\frac{1}{4}''$ Bolts And Nuts, Or
 3. No. 10 Steel Screws, Or
 4. Minimum $\frac{3}{16}''$ Steel Rivets
- (F) Secure Damper To Sleeve On 8" Centers With:
1. $\frac{1}{2}''$ long Welds, Or
 2. $\frac{1}{4}''$ Bolts And Nuts In Holes Provided, Or
 3. No. 10 Steel Screws, Or
 4. Minimum $\frac{3}{16}''$ Steel Rivets
- (G) Connect Duct To Sleeve As Shown On Figure 2 and as outlined by Schedule 2.
- (H) Install access door or panel as shown in Figure 20.

NOTES:

1. FIRE DAMPER SLEEVE CLEARANCE WITHIN WALL OPENING

Clearance requirements for damper sleeves within a wall opening is based on $\frac{1}{8}$ inch per foot of width (or height) unless otherwise stated in the listing of the assembly. The sleeve may rest on the bottom of the opening, and need not be centered. (Fractional dimensions shall be taken as the next largest whole foot.)

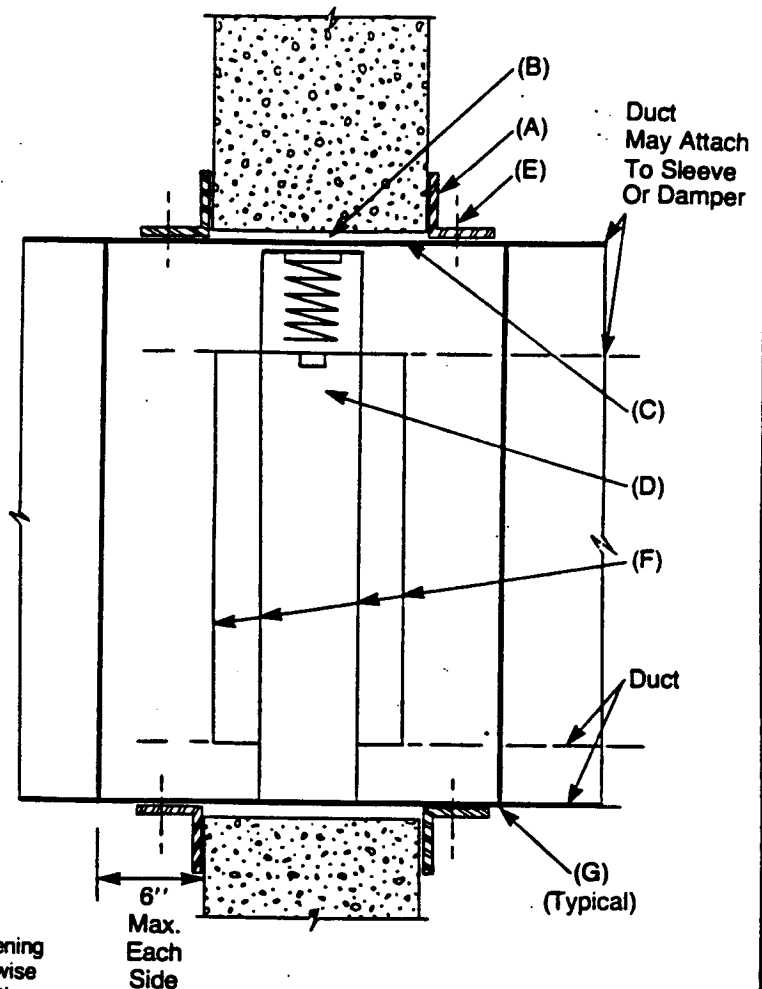
Example: A 30 inch \times 24 inch fire damper sleeve is installed in a wall opening. The opening shall be 30 $\frac{3}{4}$ inches wide ($\frac{1}{8}$ inch \times 3 feet) by 24 $\frac{1}{4}$ inches high ($\frac{1}{8}$ inch \times 2 feet.)

The sleeve is retained in the wall opening by the use of steel retaining angles (A). These must over-lap the edge of the framing by a minimum of one (1) inch over and beyond all material in the opening. This means that the minimum width of the retaining angle would be 1 $\frac{3}{8}$ inches (good practice calls for an additional safety factor by making the angle in this case 1 $\frac{1}{2}$ inches wide.)

The dimensions required for the opening shall be those remaining after the opening has been framed and fire resistive materials provided where required (see Figure 15). The fire resistive materials shall be equal to the requirements for fire resistive materials used in the constructed wall so that a continuous rating exists at the wall penetration. The contractor erecting the wall is responsible for providing the fire resistive material and correct size openings to achieve the required clearance.

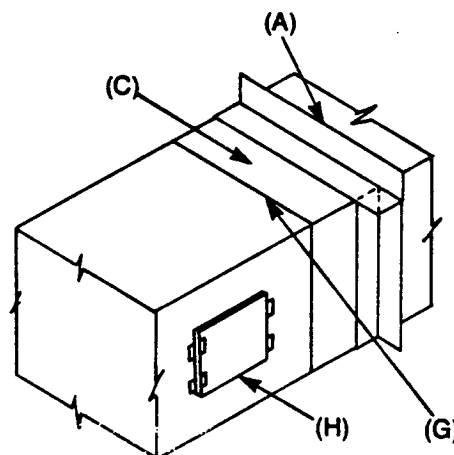
2. MANUFACTURERS' INSTALLATION DETAILS

The fire damper manufacturers' installation details and instructions as tested and approved by U.L. must be used in lieu of the above details where applicable.



Vertical Position is shown; horizontal installation is similar

Follow installation instruction for fusible links.



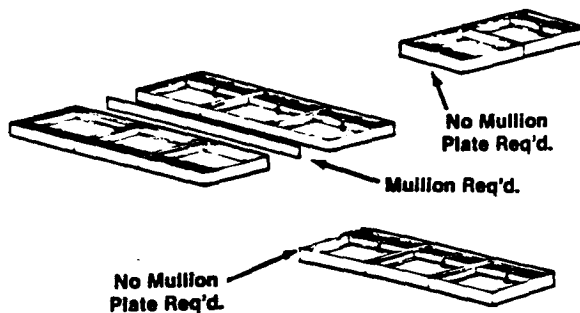
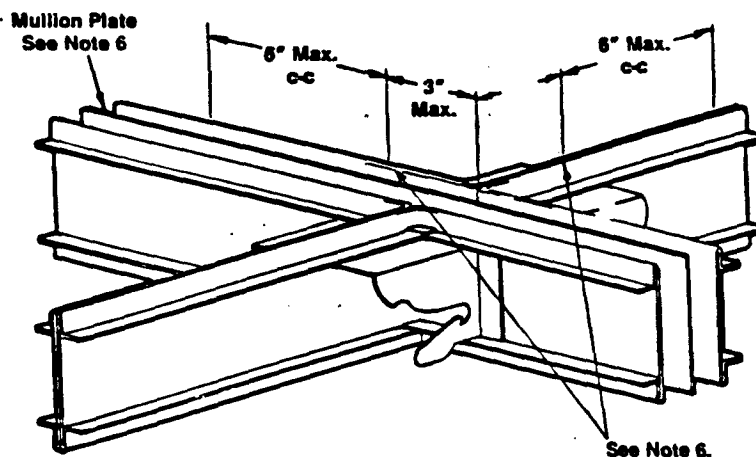
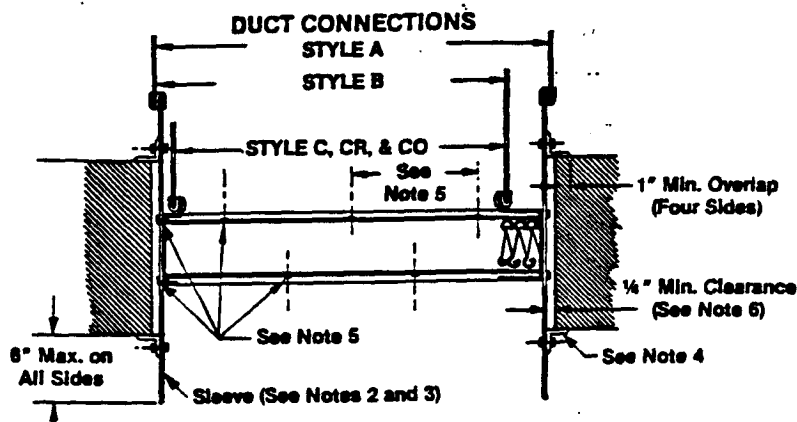
Basic Fire Damper Installation Details

Figure 2

INSTALLATION INSTRUCTIONS — HORIZONTAL **1 1/2 HOUR U.L. CLASSIFIED** **GALVANIZED OR STAINLESS STEEL CURTAIN TYPE IBD FIRE DAMPERS** **SINGLE OR MULTIPLE SECTION**

NOTES:

1. Opening in floor shall be a minimum 1/8" per foot larger than overall size of damper and sleeve assembly for galvanized steel dampers and a minimum 3/16" per foot for stainless steel dampers. Maximum opening not to exceed 1/8" per foot plus one inch for galvanized steel dampers and 3/16" per foot plus one inch for stainless steel dampers. Opening shall not be less than 1/4" larger for any size damper and sleeve assembly.
2. Sleeve gage shall be at least equal to the gage of the duct as defined by the appropriate SMACNA duct construction standard and described in NFPA 90A when one or more of the following duct-sleeve connections are used (plain "S" slip, hemmed "S" slip, standing "S" slip, reinforced standing "S" slip, inside slip joint, and double "S" slip.)
3. If any other duct-sleeve connections are used, sleeve shall be minimum of 16 gage for dampers up to 36"W x 24"H and 14 gage if damper width exceeds 36" or height exceeds 24".
4. Mounting angles shall be a minimum of 1 1/2" x 1 1/2" x 14 gage and fastened with 1/4" - 20 bolt, 1/2" long welds, 3/16" rivets, or No. 10 screws to sleeve at a maximum spacing of 6" for stainless steel and galvanized with a minimum of two connections in each side, top, and bottom (see illustration). Mounting angles for galvanized dampers 50"W x 60"H or 60"W x 50"H and less can be a minimum of 1 1/2" x 1 1/2" x 16 gage. Maximum fastener spacing for 16 gage mounting angles is 6" center to center for horizontal installation. Mounting angles shall overlap wall a minimum of one inch.
5. When multiple damper assemblies are joined or fastening damper to sleeve, dampers shall be fastened with 1/4" - 20 bolts, 3/16" rivets, or with 1/2" lg. welds staggered intermittently and spaced 6" maximum c-c.
6. The steel plate mullion shall be sandwiched between damper frames with 1/2" long welds staggered intermittently spaced 6" on center. The mullion plate between the dampers shall be a 14 gage x 4 1/2" wide steel plate of same material as damper. Length shall be equal to length (perpendicular to blade) of two or more adjoining dampers. For stainless steel units exceeding 60" x 60", the length of the mullion plate shall be equal to the width (parallel to blade) of two or more adjoining dampers. Mullions are not required for assemblies consisting of two dampers attached end-to-end or up to three dampers attached side-to-side (see example).



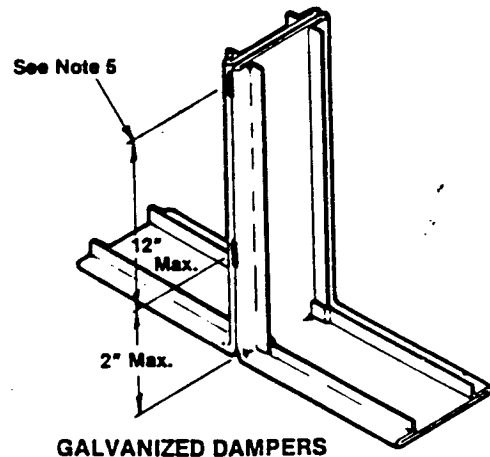
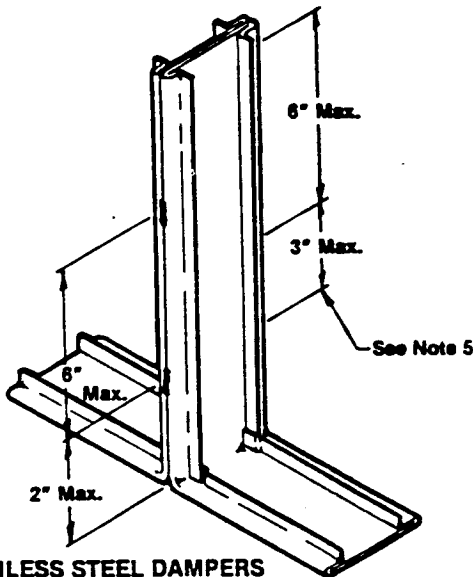
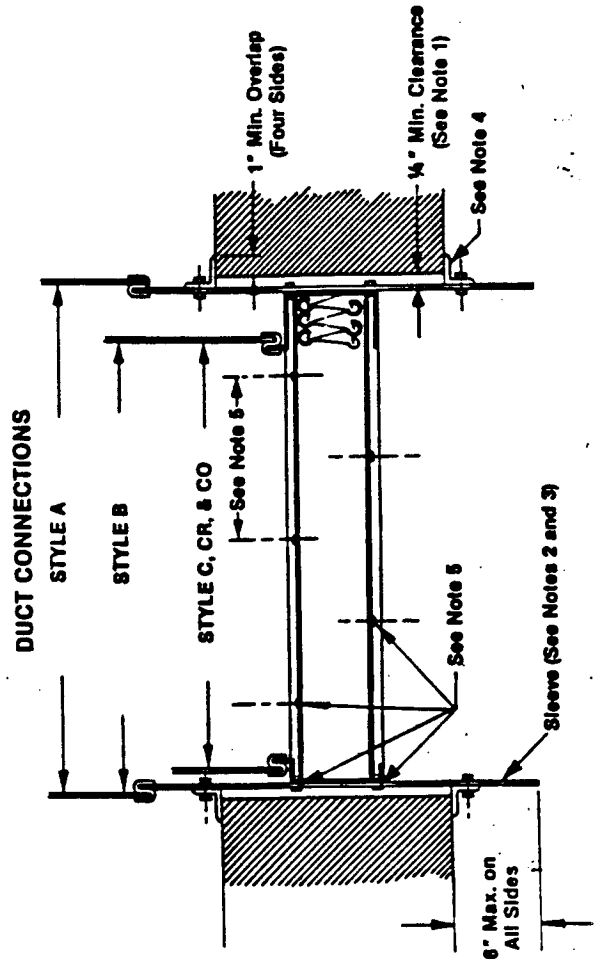
SEE DETAILS ON
 UL CLASSIFICATION
 MARKING ON ENCLOSED
 PRODUCT

Figure 3

INSTALLATION INSTRUCTIONS — VERTICAL 1 1/2 HOUR UL CLASSIFIED GALVANIZED OR STAINLESS STEEL CURTAIN TYPE IBD FIRE DAMPERS SINGLE OR MULTIPLE SECTION

NOTES:

1. Opening in wall shall be a minimum $1/8"$ per foot larger than overall size of damper and sleeve assembly for galvanized steel dampers and a minimum $3/16"$ per foot for stainless steel dampers. Maximum opening not to exceed $1/8"$ per foot plus one inch for galvanized steel dampers and $3/16"$ per foot plus one inch for stainless steel dampers. Opening shall not be less than $1/4"$ larger for any size damper and sleeve assembly.
2. Sleeve gage shall be at least equal to the gage of the duct as defined by the appropriate SMACNA duct construction standard and described in NFPA 90A when one or more of the following duct-sleeve connections are used (plain "S" slip, hemmed "S" slip, standing "S" slip, reinforced standing "S" slip, inside slip joint, and double "S" slip.)
3. If any other duct-sleeve connections are used, sleeve shall be minimum of 16 gage for dampers up to 36"W x 24"H and 14 gage if damper width exceeds 36" or height exceeds 24".
4. Mounting angles shall be a minimum of $1\frac{1}{2}"$ x $1\frac{1}{2}"$ x 14 gage and fastened with #10 bolts or screws, $1/2"$ lg. welds, or $3/16"$ rivets to sleeve at a maximum spacing of 6" for stainless steel and 12" for galvanized with a minimum of two connections in each side, top and bottom (see illustration). Mounting angles for galvanized dampers 50"W x 60"H or 60"W x 50"H and less can be a minimum of $1\frac{1}{2}"$ x $1\frac{1}{2}"$ x 16 gage. Maximum fastener spacing for 16 gage mounting angles is 12" center to center for vertical installation. Mounting angles shall overlap wall a minimum of one inch.
5. When multiple damper assemblies are joined or fastening damper to sleeve, dampers shall be fastened with no. 10 bolt or screws, $3/16"$ rivet or $1/2"$ lg. weld staggered intermittently, and spaced 12" maximum c-c for galvanized and 6" maximum c-c for stainless steel.



GALVANIZED DAMPERS



SEE DETAILS ON
UL CLASSIFICATION
MARKING ON ENCLOSED
PRODUCT

California State Fire Marshal Listing No. 3225-245:5